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09/706,475	11/03/2000	Alexei N. Pilipetskii	1006	6892

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EXAMINER

LI, SHI K

ART UNIT

PAPER NUMBER

2633

DATE MAILED: 11/17/2003

6

Please find below and/or attached an Office communication concerning this application or proceeding:

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# Office Action Summary

Application No.

09/706,475

Applicant(s)

PILIPETSKII ET AL.

Examiner

Shi K. Li

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2000 and 24 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 November 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p) because the numbers and letters of FIGs. 1-4 are not uniform, clean and well defined. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-2, 4-6, 9-10, 12-13, 16 and 19-20 are rejected under 35 U.S.C. 102(a) as being anticipated by Tsuritani et al. (T. Tsuritani et al., "Performance Comparison Between SCDCF-Based System and RDF-Based System in Slope-Compensating Transoceanic WDM Transmission", Electronics Letters, Vol. 36, No. 5, 2nd March 2000).

Regarding claims 1, 9, 13, 16 and 19-20, Tsuritani et al. discloses in FIG. 1 a transmission system with a plurality of optical fiber segments. Tsuritani et al. teaches in page 447, right col., first paragraph that the fiber type for the segments can be chosen from single mode fiber (SMF), slope compensating dispersion compensation fiber (SCDCF) and reverse-dispersion fiber (RDF), where SMF has positive dispersion and positive dispersion slope, RDF

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has negative dispersion and negative dispersion slope, and SCDCF has negative dispersion and positive dispersion slope.

Regarding claims 2 and 10, Tsuritani et al. shows in FIG. 1 six (6) spans. The first span comprises SMF and RDF.

Regarding claims 4 and 6, Tsuritani et al. teaches to compensate dispersion and dispersion slope such that the two segments of span 1 cancel the dispersion effect of each other.

Regarding claims 5 and 12, Tsuritani et al. includes in FIG. 1 repeaters rep1, rep 2, rep 3 and rep 4. Span 1 is between rep1 and rep 2; span 2 is between rep 2 and rep 3; span 3 is between rep 3 and rep 4.

4. Claims 1, 9, 16 and 19-20 are rejected under 35 U.S.C. 102(a) as being anticipated by Mukasa et al. (U.S. Patent 6,606,437 B1).

Mukasa et al. discloses in FIG. 8 a transmission system comprises fiber segments 53, 54 and 55. Mukasa et al. teaches in col. 19, Table 5 that, for the second wavelength band, segment 53 has a positive dispersion and a positive dispersion slope, segment 55 has a negative dispersion and a negative dispersion slope, and segment 54 has a negative dispersion and a positive dispersion slope.

#### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claims 1, 3, 8-11 and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (U.S. Patent 6,324,317 B1).

Regarding claims 1, 9-10, and 16-17, Tanaka et al. discloses in FIG. 1 a transmission system. FIG. 1 comprises fibers SMF 4a, RDF 4b and DCF 4c. Tanaka et al. teaches in col. 12, lines 30-36 that SMF 4a has positive dispersion and positive dispersion slope, RDF 4b has negative dispersion and negative dispersion slope. DCF 4c is used to compensate the accumulative dispersion and dispersion slope generated by the preceding spans. It is obvious from FIG. 18(A) that DCF 4c should have a positive dispersion. Also, Tanaka et al. teaches in col. 17, lines 41-42 that DCF 4c should have a dispersion in the range from  $-0.03$  to  $+0.03$  ps/nm<sup>2</sup>/Km. Therefore, a fiber type of positive dispersion with negative dispersion slope can be used for DCF 4c.

Regarding claims 3, 8, 11, 15 and 18, Tanaka et al. teaches to dispose DCF 4c every 10 spans. However, it is obvious that the maximum allowable accumulative dispersion depends on the data rate. When the data rate is high, maximum accumulative dispersion must be low to avoid interference between adjacent bits. Therefore, it is obvious that when the data rate of the signal is high, one of ordinary skill in the art would have motivated to restore the dispersion to near zero after a reasonable number of span, such as 3, to avoid exceeding the maximum allowed accumulative dispersion.

7. Claims 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuritani et al. (T. Tsuritani et al., "Performance Comparison Between SCDCF-Based System and RDF-Based System in Slope-Compensating Transoceanic WDM Transmission", Electronics Letters, Vol. 36, No. 5, 2nd March 2000) in view of Tanaka et al. (U.S. Patent 6,594,428 B1).

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Tsuritani et al. has been discussed above in regard to claims 1-2, 4-6, 9-10, 12-13, 16 and 19-20. The difference between Tsuritani et al. and the claimed invention is that Tsuritani et al. does not teaches a local average dispersion greater than zero for the first and second spans. Tanaka et al. teaches in col. 2, lines 19-23 and FIG. 1 (B) that due to nonlinear effects it is desirable to set dispersion low other than zero at the end of each span and compensate to near zero after several span to limit the accumulative dispersion so that it does not create interference between adjacent bits. Tanaka et al. gives an example such that the dispersion is restored to near zero every six (6) spans. It is obvious to one of ordinary skill in the art that restoration can be done in any reasonable number of spans, such as 3, as long as the accumulative dispersion has not exceeded a limit. One of ordinary skill in the art would have been motivated to combine the teaching of Tanaka et al. with the transmission system of Tsuritani et al. because the approach minimizes nonlinear effects and improves signal quality. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to maintain a non-zero dispersion at the first and second span and restore the dispersion to near zero at the third span, as taught by Tanaka et al., in the transmission system of Tsuritani et al. because the approach minimizes nonlinear effects and improves signal quality.

### ***Conclusion***

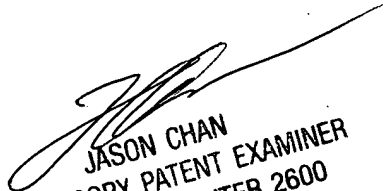
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 703 305-4341. The examiner can normally be reached on Monday-Friday (8:30 a.m. - 5:00 p.m.).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703 305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 305-3900.

skl



JASON CHAN  
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